MINISTRY FOR THE ENVIRONMENT

POLICY INSTRUMENTS FOR WASTE MINIMISATION AND MANAGEMENT IN NEW ZEALAND

A Background Document to Implementation of the New Zealand Waste Strategy

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1 Purpose of Report

The purpose of this report is to identify the policy instruments available for implementing the New Zealand Waste Strategy (the Strategy)[1] and the framework for selecting and ensuring the provision of an effective package of instruments.

The Strategy addresses 2 core issues. These are

a) minimising the generation of solid, liquid and gaseous waste in the first instance i.e. ensuring efficient resource use; and
b) minimising the environmental impacts of disposing of waste to land, water or air.

The development and implementation of the Strategy is a joint initiative between the Ministry for the Environment and Local Government New Zealand. The roles and responsibilities for each party are identified within the Strategy. Policy instruments employed by each party will vary. This document primarily relates to the role of central government (i.e. the Ministry for the Environment) and to central government policy instruments.

2 Introduction – the NZWS is a Broad Policy Instrument

Policy instruments are a means or mechanism in which to induce change. Accordingly the Strategy can itself be considered a broad policy instrument. It documents at a 'big picture' level –

- issues of concern and the barriers to effective waste minimisation and management;
- joint goals or objectives of Local Government New Zealand and the Ministry for the Environment in implementing the document;
- underlying policies and principles that will be adhered to in implementing the strategy;
- a set of targets to assist and encourage local action[2];
- criteria for prioritising action; and
- four broad categories or areas of work (referred to within the Strategy as Programmes) under which more detailed design, investigation and implemented of policy instruments will be undertaken.

[1] For background on the New Zealand Waste Strategy (NZWS) see "*The New Zealand Waste Strategy,* March 2002 (http://www.mfe.govt.nz/wasteline), and "Towards a National Waste Minimisation Strategy", December 2000 (http://www.mfe.govt.nz/about/publications/waste/Wastemin.pdf).

[2] In developing the Strategy it was acknowledged that while the vision, goals and policies adopted provide sound direction and focus for central and local government initiatives, they are often difficult to translate into day-to-day actions. For this reason more practical non-mandatory targets were included to help provide a local focus for implementing the intent of the Strategy.

The document provides an integrated and common understanding of the direction needed to address the issues and provides a platform upon which the detailed work of waste minimisation and management can then be built.

The strength of the Strategy as an instrument for change rests with the 'buy-in' achieved in its joint development and with its integrated and comprehensive design.

Now that we have the Strategy, the implementation phase begins. For central government (primarily the Ministry for the Environment) this involves detailed consideration of the issues, barriers, and the most appropriate means to intervene in order to help achieve the Strategy's goals. Intervention is generally understood to be achieved by application of policy instruments. Such instruments can extend from the least intervening of a 'do nothing' option through to suasive instruments (e.g. provision of information and guidance) and market based instruments (e.g. use of economic incentives) to mandatory legislative controls. This document provides some background on the framework for selecting instruments and the types of instruments currently under consideration by the Ministry for the Environment.

3 The Framework for Selecting Policy Instruments

3.1 The Framework within the NZWS

The Strategy itself sets out a broad framework for the selection of policy instruments. The development of policy instruments needs to consciously address the issues and barriers identified within the Strategy (pages 12 to 18) and in doing so needs to be consistent with the identified goals and targets; policies and principles; the criteria for prioritising action (page 22); and the objectives of the Strategy Programmes (pg 30).

The four Programmes direct the development of detailed policy instruments to address identified barriers. The selected Programmes recognise that the Strategy needs to work at a number of levels. At one level there is a need to signal immediate as well as long term actions that result in improved waste management (Programme 4) and minimisation (Programme 2). On another level these actions need to be backed up by information and communication (Programme 3) as well as sound legislation and institutions (Programme 1). The Programmes in combination are designed to consider the range of policy instruments available. For example, market based mechanisms to encourage improved waste management and minimization, public information and education to encourage a change in behavior and regulation to set environmental performance standards.

In 'slicing the cake' into the 4 Programmes the Programme elements were designed to:

- provide for a combination of both immediate action and long-term solutions;
- work with government, business and communities to establish long-term solutions and alternatives to waste generation;
- ensure that instrument design is a transparent process and that the community is engaged in the process.

The four Programmes have been combined with 30 targets to give specific timeframes for both policy development and the reduction and diversion of specific waste streams.

A balance is required between the use of resources to achieve the targets ("low hanging fruit") in the short term and putting the tools (eg education and economic waste instruments) in place for long term "decoupling" of waste generation from economic growth.

3.2 The Government Framework for Selecting Policy Instruments

Additional to the direction provided by the Strategy, selection of policy instruments by the Ministry for the Environment is also governed by the roles and responsibilities of central government and by the mandate appointed to it as a central government agency.

The following summarises some of the key considerations within the framework for selecting policy instruments.

1. Economic Efficiency

Policy instruments need to be economically efficient i.e. the instrument must achieve the desired environmental outcome at the lowest cost to the economy. Any instrument must also be the least trade distorting.

2. Cost-effectiveness

The instrument must achieve the maximum environmental improvement possible for the resources expended (including consideration of compliance, transaction, administration, and enforcement costs).

3. Fairness/Equity

The instrument needs to ensure fair and equitable processes and outcomes for the distribution of the associated costs and benefits.

4. Incentives for Entrepreneurship

The instrument should not be overly limiting but should encourage addressees to seek new and innovative ways of contributing to the objectives of the instrument.

5. Enforceability

The instrument needs to be aligned to the general morals of society and be able to be monitored and enforced.

6. Compatibility with other Policies

The instrument needs to be compatible with other policies that support government's sustainable development mandate (i.e. other economic, social and environmental policy). The instrument needs to look for synergies with other policies and the scope for "cross achievement" of policy objectives. The instrument needs to avoid 'double-dipping' (i.e. duplicating intervention).

7. Consistent with International Obligations

The instrument must not be inconsistent with any international obligations held by the NZ Government.

8. Political Acceptance

The instrument needs to be consistent with the leading political focus of the time. See Section 4 below for further details on this matter.

Further considerations are summarised within the Organisation of Economic Co-operation and Development's report "Improving Policy Instruments Through Impact Assessment" May 2001. These are noted as follows.

Meeting the Objective	i.e. whether or not the instrument meets the set objective to the best possible degree
	• Could there be counterproductive side effects? • Is it possible to avoid compliance? • Is misuse of the instrument possible? • Are short-term costs justified by the long-term benefit? • Is the distribution of benefits and costs justifiable and in line with the given objective? • Is there a significant discrepancy between the segment of the population that pays the price and the segment that gets the benefits?
Practicality	i.e. assess if the instrument can be effectively applied in the existing administrative structure
	• Is the instrument sufficiently flexible to accommodate all possible cases but still offers enough guidance so that discretionary provisions cannot lead to arbitrary decisions? • Are administrative requirements limited to the degree necessary? Is it probable that the cost for administering the instrument outweighs the benefit (e.g. fees for administrative services)? • Are the competencies for executing the instrument including the requirement of co-ordination clearly defined? • Is the transition from the old regulation to the new instrument clearly laid out and feasible?
Clarity	i.e. can the private sector understand the instrument correctly and comply with it in an appropriate way.
	• Is the language of the provision clear and understandable for the addresses? • Are there any contradictions in the instrument? • Are all definitions unambiguous? • Are the tasks to be carried out by the addressees clearly listed etc? • Are the cross-references within the law and to other laws kept to the necessary minimum?

Implementation Costs	i.e. costs and possible savings, directly linked to the implementation of the instrument.
	• Where will the costs be incurred? • Are the incurred costs proportional to the intended objectives of the instrument? • Are there possible savings that could set off partially/fully the costs incurred by the proposed instrument? • Is the administrative work, including that asked of the addressees (e.g. statistics, application forms, credentials, controls) proportional to the expected benefits? • Are the envisaged institutional set-up and the envisaged procedures efficient or could costs be saved if organised differently?
Interdependencies	does the new instrument create conflicting interdependencies with other legislation which may lead to unwanted side effects e.g. non-targeted addressees are benefiting from or suffering from the new instrument.
	• Is there an existing legislation that covers the same or complementary target groups? • Could there be an overlap with existing legislation that may hinder the implementation of the new instrument?

4 The Political Scene

Policy setting both influences and is influenced by the political scene of the time. Development of policy instruments needs to be consistent with the relevant leading political focus. The following provides a brief background to the recent change in focus with respect to New Zealand's waste management policy.

Past Waste Policy

The major reforms of New Zealand's Government and the economy over the past 20 years saw ardent deregulation of most sectors and the adoption of disciplined analysis of costs and benefits prior to any form of government intervention.

Due to a significant lack of quantitative information on waste streams within New Zealand, and a lack of tangible links between economic and environmental systems, national waste policy to date has largely been limited to non-regulated suasive initiatives that have focused on the effects of disposal rather than the minimisation of waste generation.

The Resource Management Act 1991 delegated the responsibility for managing the effects of discharges associated with waste disposal to regional councils. Central government supported this process by the provision of various guidelines for good environmental

management of waste disposal sites and by funding data collection in the form of National Landfill Censuses.

The Local Government Amendment Act (No. 4) 1996 requires territorial authorities to adopt a waste management plan that makes provision for the collection of waste within the district and for the minimising of waste requiring final disposal via reduction, reuse, recycling, recovery, and treatment options. Local options established by this requirement have predominantly focused on the postproduction and post-use stages of a products life with little influence on the efficient use of resources in the first instance.

Having delegated the responsibility for ensuring that waste requiring final disposal is minimised, central government has to date not actively been involved in this process.

Recent Changes

More recently with the wider international focus on the need to consider the environmental impacts of economic and social development and the limitations of the worlds available resources linkages between economic and environmental policy have become stronger with a change in emphasis away from the need for immediate and substantive economic justification for government intervention. The concept of sustainable development and disciplines such as life cycle and materials flow analysis, ecological foot-printing, and environmental resource economics have gained in credibility and are now actively being incorporated into waste policy internationally.

Further, as the profile of environmental issues is building within New Zealand it is becoming more accepted that environmental risks cannot always be precisely predicted and that early action can be more effective than waiting for the support of stringent quantitative data.

Within New Zealand waste policies of recent governments have included the setting of national waste reduction targets (1990), the adoption of 'waster pays' principles (1992), backing an eco-labelling programme (1995), intervention in hazardous waste management (1995), and consideration of national economic instruments such as a landfill levy. See Appendix A for details.

Heading into the 2002 election the manifestos of 4 out of the 5 main parties included a selection of suasive, market based and mandatory instruments to curb waste generation and manage the effects of disposal. See Appendix B for details.

Decoupling Economic Growth and Environmental Degradation

'Decoupling' of economic growth and environmental degradation refers to breaking the relationship between economic growth (i.e. an economic good) and any associated adverse environmental impact (i.e. an environmental bad). It is a concept that is gaining importance as more international focus is provided to striving for sustainable development.

Historically the economic growth of developed countries has relied on transforming the stocks of natural resources into other forms of capital. In many instances this has involved practices of unsustainable resource use and the uncontrolled discarding of waste.

More recently it has been recognised that the need to maintain ecosystems that support economic and social development is crucial to ensuring sustainable development and therefore contributing to high levels of human well-being.

Within New Zealand we are supported by a relative abundance of natural resources. New Zealand's economy is highly dependent on these resources since they contribute to a large fraction of its exports and attract foreign tourists.

New Zealand is also a large importer of manufactured goods with extensive associated packaging and often short useable life spans. This creates a heavy demand for either recycling options or final disposal facilities.

Out of 30 member countries recently assessed in a study undertaken by the Organisation of Economic Co-operation and Development[3], New Zealand was one of only four member countries that had not shown a decoupling of municipal waste going to final landfill from private final consumption (PFC). While this is not a direct measure of the environment's capacity to sustain, absorb or resist pressures of various kinds (e.g. deposition, discharge or harvest) and available data limited the study to the period between 1995 and 1999, it is a useful means to compare the effects of New Zealand practices with those applied elsewhere.

For example, nine of the OECD Europe countries (Austria, Belgium, Denmark, Germany, Italy, Luxemburg, Netherlands, Norway and Switzerland) recorded a significant absolute decoupling with the amounts of waste going to final disposal falling by between 9% and 40% during the study period. In the OECD Pacific, an absolute decoupling occurred in Korea, where the amount of waste going to final disposal fell by 27% while PFC grew by almost 9%.

The decoupling concept is built into the New Zealand Waste Strategy with the Strategy working towards 'win-win' solutions to New Zealand's waste problems while adding value to the countries social and economic development.

5 Policy Instruments being Considered

5.1 Matrix of Instruments

Having identified the broad direction and framework for determining appropriate intervention the Ministry for the Environment is now in the process of developing a comprehensive package of policy tools to meet their responsibilities in the joint implementation of the Strategy.

Appendix C identifies a number of examples of potential instruments that can be applied. Both existing instruments and those currently being considered or developed are depicted.

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[3] "*Indicators to Measure Decoupling of Environmental Pressure from Economic Growth*", Environment Directorate, OECD, 2002.

This further illustrates the move from a history of suasive central government intervention in waste issues to the current phase of considering more active market based means to generate changes.

In order to achieve both immediate and long term effective change a combination of suasive, market based, and mandatory instruments are likely to be required. The relative mix will be specific to the issue and objective sought.

The following Sections provide some background to the types of tools being considered and/or developed in support of the Strategy. It is not a complete coverage of the work being undertaken by the Ministry's Pollution and Waste Group but is a sample to illustrate some of the considerations behind the policy approach being applied.

5.2 Legislation and Institutions

Any form of market based or mandatory intervention will need the backing of appropriate institutions and legislation. Also, in order for local government to participate effectively, the legislation needs to identify a clear mandate for such intervention and to clearly define differences between local and regional government roles and responsibilities.

With this in mind the Ministry for the Environment is currently in the process of reviewing waste-related provisions within existing legislation with the objective of ensuring that there is a sound institutional and legislative base for implementing the Strategy. This will include consideration of the opportunities for making better use of and for improving the existing provisions as well as the potential legislative and institutional needs that may arise as other active and mandatory instruments evolve.

The message received from waste management practitioners during the consultation phase to the document *Towards a National Waste Minimisation Strategy, December 2000* was that they considered the current legislation is not adequate. It was acknowledged that the effects-based Resource Management Act, whilst generally suitable for the management of waste disposal activities, does not give sufficient weight to the prevention or minimisation of waste generation. Many submissions received supported a dedicated waste minimisation law rather than grafting such matters onto the Resource Management Act. The review will look at the evidence behind these views and the options for improving existing arrangements. The review includes consideration of the waste management provisions of the Local Government Act.

5.3 Market Based Instruments

5.3.1 Discussion

Pre, during, and post development of the NZWS there has been much demand for the use of market based instruments to encourage waste minimisation and decouple the relationship between increasing economic growth and increasing waste generation.

Rather than applying mandatory controls that direct behaviour (and often consequently stifle innovation), market based instruments create incentives and the flexibility for waste generators to consider alternative options. For example when fixed at an appropriate level

environmental charges ensure the achievement of the chosen objectives at a minimum overall cost i.e. those that can most cost effectively achieve the change will, the others will continue to pay the charge – thus encouraging an economically efficient means to achieve the objectives.

Other benefits of implementing market based instruments are that they

- provide an ongoing incentive for 'environmentally friendly' behaviour and an incentive to identify technical changes through research and development of more efficient waste minimising processes and technologies;
- provide flexibility both to public authorities (it is generally easier to modify and adjust the rate of a charge than to change regulations) and to private entities (freedom of choice regarding the preferred method of adjustment is preserved); and
- can potentially provide a source of income which can be earmarked for environmental protection, in this case to support waste minimisation initiatives.

There are a number of economic tools that can be applied, each with their own focus, design details and support needs. Economic instruments currently considered most relevant to the waste scene are identified within Appendix 3.

5.3.2 Potential Intervention

The Ministry is considering the development and use of market based instruments specifically to:

- reduce waste generation (including 'top of the pipe' i.e. efficient resource use, and 'end of the pipe' i.e. recovery, reuse, recycling to minimise both volume and toxicity of waste requiring final disposal);
- reduce barriers to using recovered materials in NZ; and
- change wasteful behaviour.

The scope of this work includes addressing

- each of solid, liquid and gaseous wastes;
- national, regional and local options; and
- the behaviour of government, businesses and individuals.

5.4 Waste Data

5.4.1 Discussion

Quality information (i.e. fit for purpose) is critical to sound monitoring and decision-making. With respect to the waste scene quality information or data is essential to better understand the issues and opportunities thus supporting policy decision-making, and to monitor the effectiveness of waste initiatives and the Strategy itself. Further, lack of waste information is a significant barrier to identifying market opportunities for recyclable materials.

The data needs to be of a form that can be logically combined to provide district, regional and national data sets and to be sufficiently consistent over time to illustrate trends in waste streams.

While many operators within the waste scene monitor and collect information for their own purposes the ability to 'regionalise' or nationalise the data is limited by the varying details and systems involved. Further much of the information is considered to be commercially sensitive and is therefore not readily available for broader use.

Over the past 10 years there has been a number of national[4] and local initiatives aimed at improving the collection and aggregating of waste data. While some gains have been made the data sets are still limited to snapshots of waste disposal quantities or composition at given points in times and there has been little progress in producing a comprehensive and continuous system for collecting and collating waste data.

Lack of any significant progress in this area was a key catalyst for including within the Strategy specific targets and a dedicated Programme relating to improving information collection and communication. The scope of this Programme includes the spectrum of solid, liquid and gaseous wastes and the targets provide a focus on improving the collection of information from specific waste streams e.g. municipal and industrial wastewater, green wastes, construction & demolition wastes and general municipal solid waste.

5.4.2 Potential Intervention

The Ministry proposes to continue with a supportive role in information collection with the potential for applying more mandatory requirements at a later date if sufficient success is not gained by this initial approach. Over the next 18 months the Ministry intends to work with the waste industry and local government to develop guidance to the type of information needed and a process or means by which to collect such information.

The current waste information project builds on the previous work and focuses on providing tools for the generators of waste data with an emphasis on consistent collection of waste data and the development of relevant reporting templates.

The Solid Waste Analysis Protocol (SWAP) was published in March 2002 and updates the Waste Analysis Protocol (MfE, 1992). The SWAP provides a methodology for determining waste composition either at the point of disposal or for kerbside refuse collection systems. The Ministry is continuing to support the SWAP through workshops on application of the protocol (in May/June 2002), provision of additional resources on the Waste Line website and initiating and joint funding the SWAP Baseline programme[5].

The Ministry also proposes to develop a Waste Data Network (WDN) i.e. an online waste data management system. The data management system will add value to the SWAP results and data generated by individual waste companies. The WDN will initially deal with solid waste

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[4] These have included the Waste Analysis Protocol (WAP) (MfE, 1992), The Waste Data Report (MfE 1997), The State of New Zealand's Environment (MfE 1997), the 1995 National Landfill Census (MfE 1997) and the 1998/99 National Landfill Census (MfE, 2000).

[5] The SWAP Baseline programme will provide data from 4 indicator sites around New Zealand and will allow the results from past SWAP snapshot surveys to be considered in light of the seasonal and annual variation measured through the Baseline surveys.

but it is intended that it will eventually be expanded to also include liquid, gaseous and hazardous wastes.

In addition, to develop a conceptual framework for collecting, analysing and reporting data, the Ministry has proposed to develop a Waste Monitoring Guide in consultation with the waste management community in general and with the assistance of the pilot groups established during development of the WDN. This guide will assist all collectors and users of waste data to treat waste information in a consistent and robust manner.

All of this work is based around the understanding that the source of quality information is through well-informed voluntary participation of local authorities and waste recycling and disposal operators. Offering 'win-win' assistance is a key to such participation.

The achievements of this approach are to be reviewed in late 2003 and consideration will at that time be given to the potential need for more active intervention. Also application of market based instruments such as a waste levy may support a means of mandatory information collection.

5.5 Organics

5.5.1 Discussion

The drivers for intervention acknowledged within the Strategy are that organic wastes make up a large portion of New Zealand's solid waste stream (approximately 40% based on 1997 data) thus substantially reducing the life of landfill facilities and that in the process of breaking down they contribute to the generation of leachate and methane[6]. Uncontrolled leachate discharges may contaminate surface water bodies and groundwater aquifers while methane released to the atmosphere contributes to global warming[7].

Many cities and districts throughout New Zealand have over recent years established composting facilities for organic garden waste. While individual councils have information on diversion of organic waste from landfill disposal, this data has not been aggregated and consequently there is limited information available at a national level on the total volume of organic waste generated and the amounts diverted from the landfill.

The relationship to climate change policy is significant. The New Zealand Government's Preferred Policy Package on Climate Change includes a reliance on the New Zealand Waste Strategy to reduce methane emissions from landfills by approximately 35% by 2010. Progress made under the Strategy will be reviewed by the Climate Change Project in 2005 with the potential for more direct intervention at this stage should the achievements of the Strategy be limited.

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[6] Methane is generated due to the anaerobic decomposition of organic matter in landfills. Natural decomposition is predominantly anaerobic and produces carbon dioxide and water.

[7] Methane is a greenhouse gas that is 21 times more potent in a global warming sense than carbon dioxide.

Some larger landfills in New Zealand are capturing a percentage of the methane produced through waste decomposition and burning it to generate 'renewable' energy. However capture of methane from landfill waste decomposition is an inefficient way to recover the potential energy within organics. Typical capture rates are in the order of 30% to 50% of the methane produced.

There are examples of waste-wood and sawdust fired boilers at timber processing sites around New Zealand and in some cases excess energy is being used to generate electricity.

Within the Strategy a bundle of 5 targets have been established with the short term focus on establishing sound information collection systems and local target setting, and a longer term focus based on achieving diversion of garden wastes, sewage sludge and commercial organic wastes to alternative beneficial uses over the next 8 years.

5.5.2 Potential Intervention

The Ministry is currently considering a combination of suasive and market based instruments for intervention in the organics waste stream. The emphasis is currently on suasive intervention with a view to generating guidance material that is relevant and useful for industry players and regulators. Such intervention has been selected over market based and mandatory methods predominantly due to the long lead-in times for the introduction of associated and necessary legislation. Guidance produced through a consultative process may provide the starting point for developing statutory standards.

A key aspect of the organics programme is working with a representative group from the organics processing industry to develop strategies for addressing the issues noted above. To this end the Ministry is currently taking a facilitating and guidance role.

The Waste Data Project discussed in the previous section will provide information on organics diversion i.e. quantities of organic waste diverted from disposal.

The work on economic instruments can either address organics via a tool that relates to waste generally, for example a general landfill levy, or organics could be specifically targeted via a differentiated levy (see Section 5.3 of this report for details).

The Ministry will develop an information directory outlining information available within New Zealand and internationally on organics processing and product quality (through a literature review and web based resource listing). This will provide organisation's in NZ with access to information about best practice and assist organics processors in New Zealand to operate in accordance with local and international best practice. Where appropriate information is not available the Ministry will work with the industry to identify needs and develop appropriate guidance, this could take the form of industry guidelines, MfE guidelines or statutory standards.

A key aspect of successfully diverting organics waste from landfill disposal is enabling processors to generate adequate return on their investment in processing and marketing of the products they produce. To this end the Ministry will work with the industry to ensure that appropriate product specifications are developed and implemented in New Zealand. There

is also potential to work with other interested parties to fund research on specific issues such as herbicide contamination or climate change impacts associated with organics processing.

Research funding is likely to in the first instance be directed to considering the implications of matters such as the impacts of herbicides (e.g. clopyralid) on the quality of composting materials and the relative merits of diverting organics from landfills.

Contamination of compost with residual herbicides from green waste feedstock has been identified as an issue in New Zealand and internationally. Of significant concern is clopyralid, which persists through 'good practise' aerobic composting processes, remains active at very low concentration against a wide range of beneficial plants, and puts markets for compost at significant risk. To date the Ministry has not taken an active role in initiatives to address this issue. Overseas, licensing agencies have banned use of this herbicide in lawn applications. The composting industry has asked ERMA to review the licence for clopyralid, and MfE needs to advise ERMA of the policy implications for the Strategy if compost product markets continue to be put at risk. Following this action, we will maintain a watching brief together with other issues pertaining to compost quality.

5.6 Construction and Demolition Waste

5.6.1 Discussion

Construction and demolition waste makes up a significant portion of New Zealand's solid waste stream (approximately 17% based on 1997 data). It primarily consists of uncontaminated[8] dirt, concrete, bricks, wood-waste, plastics and other assorted waste from demolition or construction sites. While many of these wastes are essentially inert, some have the potential to decompose and produce leachate.

Construction and demolition waste is increasingly being disposed of at dedicated sites (referred to as cleanfills) rather than municipal landfill sites. This trend is a result of increasing municipal landfill charges and in some cases landfill operators banning cleanfill disposal at their sites. Many cleanfills do not require resource consents (i.e. they are permitted activities) and accordingly there is little monitoring of what is being disposed of to these voids. Further many of these sites do not include leachate prevention and collection systems therefore depending on what is actually disposed they can pose a risk to the environment.

Much of the construction and demolition waste stream is reusable though such options are not readily being adopted. Concrete can be crushed and used for aggregate but has to compete with virgin aggregate that is often in plentiful supply around New Zealand. Wood-waste can be collected to generate industrial heat and power using cogeneration technology. To date the focus has been on use of wood processing residues (sawdust and bark from wood processing sites) however there is potential to use harvesting residues and wood-waste from construction and demolition activities. A significant barrier to using C&D wood-waste is the presence of treated wood[9]. Possible solutions including identifying and

[8] To establish the meaning of "uncontaminated" see *A Guide to the Management of Cleanfills*, MFE 2002

[9] Treatment systems in NZ include CCA (Copper Chrome Arsenic), Boric and LOSP.

removing treated wood or putting in place appropriate pollution control equipment to allow the incineration of treated timber. Further, wood-waste entering cleanfills is covered by the organics targets of the Strategy and has significant implications for both the Climate Change and Energy Efficiency programmes within government.

5.6.2 Potential Intervention

The current focus is on suasive intervention to improve the collection of information upon which decisions can then be made; to provide guidance...; and to encourage the development of sound market alternatives for this material.

As noted elsewhere in this report implementation of the strategy requires good information about waste including disposal and diversion. In order to work with industries to seek alternative uses of construction and demolition waste we need sound information for this waste stream. This is to be addressed by the Waste Data Network (see Section 5.4 of this report).

In 2002 the Ministry completed a "*Guide to the Management of Cleanfills*" to clearly outline which construction and demolition waste can be considered inert and therefore appropriate for disposal to cleanfill sites.

The Ministry will continue to promote and support the *Guide to the Management of Cleanfills* and is considering developing an information directory outlining information available within New Zealand and internationally on construction and demolition waste processing and product quality (through a literature review and web based resource listing). This would provide access to information about best practice and assist construction and demolition waste processors in New Zealand to operate in accordance with national and international best practice. Where appropriate information is not available the Ministry will work with the industry to identify needs and develop appropriate guidance, this could take the form of industry guidelines, NZ Standards, MfE guidelines or statutory standards.

A key aspect of successfully diverting C&D waste from landfill disposal is enabling recycling processors to generate adequate return on their investment in processing and marketing of their products. To this end the Ministry will consider working with industries to ensure that appropriate product specifications are developed and implemented in New Zealand.

Other government projects will influence this waste stream. For example the Energy Efficiency and Conservation Authority as part of the implementation of the National Energy Efficiency and Conservation Strategy are likely to increase the demand for wood-waste as a fuel for energy generation.

5.7 Hazardous Waste

5.7.1 The Generation of Hazardous Wastes

Hazardous wastes are derived from many sources. For example households, industry, small businesses, school laboratories, to name a few. A waste is considered hazardous if it poses a risk to people or the environment by not being managed, stored or disposed of properly.

Hazardous wastes include a large range of materials, from acid wash waters to spent fluorescent light bulbs.

The Ministry's Hazardous Waste Management Programme was established in 1997 to review, and develop tools to improve the management of hazardous waste. For example:

- a national definition of hazardous waste;
- "*Guidelines for the Management of Hazardous Waste*", 2002;
- a policy addressing the reduction, reuse, recycling, treatment, disposal and residual management of hazardous waste; and
- a mix of regulatory and non-regulatory tools to address the different aspects of hazardous waste management

There is very little good information on the amount of hazardous waste generated in New Zealand and there are many accounts of poor hazardous waste management practices. A reason for this is a lack of knowledge about identifying and managing hazardous wastes. There needs to be practical, understandable guidance for business, industry, and the public to learn how to manage hazardous waste properly.

Developing a national definition of hazardous waste will ensure consistent identification. Current definitions of hazardous waste are done at a local level, and vary significantly throughout the country. Some wastes that are typically regarded as hazardous are labelled "special wastes" and continue to be disposed of in unlined refuse dumps. Liquid hazardous wastes are often tipped into stormwater drains, or dumped to sewer without a discharge permit. Currently, there are limited powers for councils to track the management of hazardous waste. The Ministry is developing record-keeping systems to enable tracking and to provide information to local and central government in the development of hazardous waste management policy.

Many hazardous wastes are an unvalued resource. For example, Ni-Cd batteries contain metals that can be recycled if facilities exist. There is currently no incentive and few opportunities for business to recycle Ni-Cd batteries and other hazardous waste streams. The development of market based instruments is being considered as a means to create incentives for hazardous waste recovery and recycling operations.

5.7.2 Disposal of Hazardous Wastes

Contaminants derived from hazardous waste in a "substandard" landfill can be leached out of the landfill and released into the environment. The release of hazardous constituents from landfills can have long-term adverse environmental effects and potentially damage human health.

Landfill Waste Acceptance Criteria determine whether waste may be safely disposed of in a landfill. Most (but not all) New Zealand landfills include such criteria as a condition of their resource consent however many resource consent conditions are vague or ineffective. A further inconsistency between regions in terms of the standards applied creates incentives for hazardous waste to "travel" to landfills with lesser controls.

The Ministry believes that to avoid such inconsistencies and to ensure an adequate standard is met the control of hazardous waste disposal needs to be directed from a national level.

There has already been a considerable amount of thought and consultation on what form this could take. At this point in time the recommended approach includes the development of a nationally consistent landfill classification system that divides landfills into two classes based upon their degree of environmental protection. National landfill waste acceptance criteria would define what wastes are acceptable for disposal in the differing landfill classes.

The appropriate policy instruments will be recommended after further analysis of the most efficient and effective method of implementation. The potential for the development of mandatory controls in the form of a National Environmental Standard is being closely considered.

5.8 Contaminated sites

5.8.1 Discussion

Contaminated sites in New Zealand are a legacy of inappropriate handling and management of hazardous chemicals, and past disposal practices including those considered to be safe and acceptable at the time. As such, the management of contaminated sites is integrally linked to the management of hazardous substances and hazardous waste. The Government's *Environment 2010 Strategy* includes the following goal for contaminated sites: *Cleaning up contaminated sites to reduce risk to the environment, people and the economy.*

The potential for adverse environmental and human health effects has meant that the profile of contaminated sites has increased significantly over the last decade. In response, central government has provided guidance on sites contaminated for certain industry activities (gasworks, oil industry and timber treatment). Other more generic advice applicable to a broader range of sites has been, and continues to be, developed. The Ministry has also established an indicator of sites using regionally compiled data. However this is by no means complete, and cannot be considered a national register.

Regional authorities involved in the day-to-day management of contaminated sites consider that progress is hindered by the lack of an overarching contaminated site framework, uncertainty over roles and responsibilities and the vexing question of liability.

5.8.2 Potential intervention

In the process of reviewing the Resource Management Act 1991 the Ministry is considering the following options:

- implementing government policy[10] on liability for 'historic' sites (i.e. where contamination occurred prior to the enactment of the RMA);
- assigning regional councils the function of executing oversight and coordination of policies and plans concerning the assessment and management of contaminated sites to protect human health and the environment (ss 30/31); and

[10] Cabinet agreed, 9 August 1999, that the RMA be amended to provide that: (i) the polluter should be included as a potentially liable party for pre-1991 contaminated sites; (ii) there be an innocent landowner defence (to apply pre-RMA only).

- enabling resource consents for the passive discharge of contaminants arising from contaminated sites.

Policies for intervention are also being considered for the following:

- an integrated application of RMA, HSNO, LGOIMA, Building Act, Health Act, Local Government Act (outlining duties, roles and responsibilities);
- the recording and management of information to ensure that (particularly at the point of property transfer and/or change of land use) the ongoing and future land use is safe for its intended use;
- clarity over liability for information administered by the local authority if wrongly reported to the council;
- whether there should be a legal duty on an owner to report information for inclusion on the LIM, and requiring an acceptable level of investigation, monitoring and reporting in relation to site investigations;
- good practise within a legal framework of the difference between reasonable and unreasonable public access to council administered site information that balances the protection of property rights for confidentiality and the right of prospective owners (and the public) to know of the existence of contamination;
- the integrated (seamless) administration of contaminated sites within (i) the context of waste and hazardous waste management (ii) a 'one-stop shop' approach for consents (iii) nationally consistent policies and information management systems among local authorities;
- local authorities to recover costs for site investigation, review of site assessments, consent provisions;
- a training scheme for professional staff appropriate to the interdisciplinary nature of all aspects of contaminated sites assessment and management;
- a nationally approved audit scheme for the determination and maintenance of the standard of professional practise in NZ regarding the acceptance and approval of site risk assessments and remedial action plans; and
- information about the efficacy and environmental impacts of remediation technologies, and in particular, clarity about which agencies are responsible for approving permits (so that technology providers know who to go to, agencies assess applications efficiently, and remediation is facilitated).

5.9 Dioxins

5.9.1 Discussion

Dioxins belong to a class of environmental pollutants known as organochlorines. As persistent organochlorines dioxins are toxic, do not readily breakdown in the environment, and accumulate in human and animal tissue. Animal studies show that dioxins are extremely toxic. Although less is known about its impact on human health, it is widely assumed that dioxin has the potential to cause neurobehavioural, developmental, reproductive and immunotoxic effects, and cancer. Although the current dioxin intake of New Zealanders is relatively low compared with other industrialised countries, it is close to the World Health

Organization's tolerable daily intake. A major portion of the dioxin that enters the body of the typical New Zealander originates as a discharge to air and is eventually ingested in meat and dairy products.

The Government's goal is to protect human health and the environment from risks posed by dioxin. The Ministry is focused on four areas: discharges to air, deposition on to land and into landfills, soil concentrations appropriate for different land uses, and direct entry into food manufacturing processes.

5.9.2 Potential Intervention

Given the scale and potential risks posed the Ministry considers national controls are necessary on the discharge of dioxins to air and that National Environmental Standards (NES) under the Resource Management Act are an appropriate tool to implement this.

It has been recommended that the NES

- place a national ban on dioxin discharges to air from landfill fires - the single largest source of dioxin discharges to air;
- place a ban on the discharge of dioxins to air from domestic burning and from waste burned on farms (excluding vegetation, untreated wood, paper and cardboard) - second largest source of dioxin discharges to air;
- set an upper limit on the discharge of dioxins to air from waste incinerators; and
- address co-incineration of municipal waste, the incineration of medical waste, hazardous waste and sewage sludge.

5.10 Special Waste

5.10.1 Discussion

Certain wastes can cause particular problems and require special management in order to minimise their impact on the environment. These are referred to as special wastes. They can be hazardous, cause problems in landfills or trade waste systems, and are often dispersed widely through the community. Examples might be used oil, tyres, end of life vehicles and batteries.

The Ministry has developed a framework for prioritising special wastes, based on the following criteria:

- Eco-toxicity: how much harm does it cause to the environment?
- Socio-toxicity: how large is the waste stream, what potentially recoverable materials are we losing if this waste is not managed properly, and how much does society appear to care about it?
- Can we do something: is there a technological solution, and do we have the capacity in New Zealand (groups ready and able to provide the technology)?
- Should we do something: Are we already involved? Is the issue already being dealt with elsewhere? Is there a useful/essential role for Central Government?

Based on these criteria, MfE has identified used oil and tyres as priority special wastes followed by end of life vehicles and batteries.

5.10.2 Potential Intervention

The make up of policy instruments to address these wastes streams has not yet been identified. In some cases relatively little intervention may be required. Others may suit market based intervention such as deposit-refund systems, compulsory take-back instruments and levy-based programmes. No one option will suit all special wastes – issues such as the shape of the market, how many importers and retailers there are, ease of transport and the demand for recovered material are factors that will affect the usefulness of the particular policy instruments. A market based and regulatory options for used oil are currently being considered.

5.11 Landfill Management

5.11.1 Discussion

The Ministry advocates high environmental standards, consistently and effectively applied, as a critical aspect of protecting the environment and human health.

The Ministry has recently completed a Landfill Review and Audit consisting of an update or progress check of the results of the 1995 and 1998/99 National Landfill Censuses and a screening risk assessment for all operating landfills. Put briefly, the results indicate that:

- The percentage of operating landfills that are inappropriately sited, designed or operated is decreasing i.e. landfills in New Zealand are improving.
- The total number of landfills is decreasing
- New landfills and those with new consents are more likely to be consistent with good practice
- In the absence of some further intervention, there are likely to be several existing 'substandard' landfill sites still operating in New Zealand after 2010.
- There is a large amount of guidance material available but it would appear that some landfill operators and regulators are not making use of the resources available.

The Landfill Review and Audit suggests that the barriers to improved landfill management include:

- The cost of implementing best practice for new sites and upgrades at existing sites.
- The application of a pure effects based approach despite an element of uncertainty about the fate and transport of contaminants disposed of at landfills.

To date the Ministry has chosen to adopt a suasive approach to achieving improved management of landfill sites. This has included the provision of guidance material for landfill siting, design, operation, consent conditions, closing landfills and full cost accounting to

ensure landfill operators and regulators have a sound source of information to call on[11]. The development of each guideline document has been followed by training workshops.

At this point in time it is difficult to assess the effectiveness of the guidelines since they are intended to address issues that may arise every 20-30 years for any given site.

The Ministry has submitted on several landfill consent applications where aspects of the proposed activity have been considered to be 'substandard'. In this context the Landfill Guidelines (CAE 2000) have been used as a guide to good practice.

The Ministry has to varying degrees been successful in gaining relief sought where submissions have been lodged. The publicity surrounding submissions to consents has also resulted in applicants for other landfill developments contacting the Ministry for comment prior to lodging their applications. This is a more cost effective means to gaining the desired outcomes and despite some of our requests being declined it is considered that overall the Ministry's submissions on landfill consent applications have been influential in improving landfill design, siting and operation and increasing acceptance that management of all landfills in New Zealand should be consistent with good practice.

5.11.2 Potential Intervention

The implementation of the Strategy requires good information about waste including disposal and diversion. The waste information project aims to develop systems to ensure that information is consistently collected, analysed and reported throughout NZ. The waste Information project will provide information on quantities and composition of waste disposed of to landfill. The specifics of the waste information project are presented in Section 5.4.

The Ministry intends to continue with the Landfill Review and Audit project to ensure the collection of information to enable the Ministry to assess the effectiveness of interventions on landfill management that have and are being applied, and to identify remaining barriers that require addressing.

The Ministry also intends to continue with the Landfill Guidelines project to add value to the guidelines already available by developing web-based resources to enhance awareness and application of them. Examples include the potential to create a searchable database of example consent conditions and on-line guidance for waste charging based on the Full Cost Accounting Guide

Suasive intervention has been selected over market based and mandatory measures predominantly due to the long lead in times for the introduction of mandatory standards. Where the effects of an activity have the potential for significant adverse environmental

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[11] *The Landfill Guidelines* (1992) – revised 2000; *Landfill Full Cost Accounting Guide* (1996) – revised 2002; *The 1995 National Landfill Census* (1997); *The 1998/1999 National Landfill Census Report* (2000); *Landfill Guidelines* (CAE, 2000); *The Guide for the Management of Closing and Closed Landfills* (2001); *The Guide Landfill Consent Conditions* (2001); *The Guide to Managing Cleanfills* (2002); *The Landfill Full Cost Accounting Guide for New Zealand* (2002); *The Landfill Review and Audit* (to be published late 2002)

effects mandatory intervention is being considered (e.g. the Landfill Waste Acceptance Criteria, see Section 5.7.2) that builds upon the guidance material already available.

5.12 Sewage and Wastewater

5.12.1 Discussion

It is still common for smaller cities within New Zealand to be discharging untreated sewage and wastewater directly to local streams or coastal areas. This practice is considered culturally offensive, particularly with respect to Maori values, and along with discharges from substandard treatment plants has resulted in human health issues and threatened local ecosystems. There is growing demand on existing sewage and wastewater treatment plants with many having to cope with unnecessary volumes due to stormwater ingression. These types of issues have meant recent resource consent applications have received significant public opposition (e.g. Christchurch City Council's application to discharge to the Avon-Heathcote Estuary).

The Strategy recognises the links between the solid, liquid and gaseous mediums and the need to provide a holistic approach that addresses each waste stream and avoids creating distortions in outcomes. The Strategy contains a number of liquid waste targets including the requirement for all substandard sewage and wastewater treatment systems to be upgraded, closed or replaced by 2020.

5.12.2 Potential Intervention

The Ministry has chosen to provide some guidance in the interim while the nature and scale of the issues/barriers are more clearly identified.

Accordingly the Ministry is currently –

- developing *The Sewage Handbook*, a guide to the assist communities faced with the need to upgrade existing wastewater systems;
- developing *The Wastewater Monitoring Guidelines*, a guide to assist regional and district council develop monitoring programmes that reflect the true environmental risks posed by wastewater treatment systems; and
- contributing to the development of the *Liquid Waste Contractors Code of Practice.*

Over the next 12 months the Ministry will be managing a research project funded by the Cross Departmental Research Pool that will examine the risk components within sewage effluent and sludge. The Ministry has also committed funds for a comprehensive information gathering exercise to collate all management and technical resources that are relevant to the wastewater industry.

This information will then be pulled together to support the development of a comprehensive programme for wastewater policy. Development of such a programme will rely on active input from the wastewater industry and stakeholders.

The need for market based or mandatory forms of intervention will be considered following the outcomes of the above works.

5.13 Trade Waste

Territorial authorities are empowered under the Local Government Act 1974 to establish trade waste bylaws. Approximately 80% of territorial authorities have done so, many adopting a modified version of the New Zealand Standard Model Trade Waste Bylaw (NZS 9201:Part 23:1999).

The Waste Strategy contains targets that by December 2005 all territorial authorities will have implemented and be monitoring trade waste bylaws based on the New Zealand Standard Model, and that all holders of new or renewed trade waste permits will have in place a recognised waste minimisation and management programme.

The Ministry has not historically intervened in the wastewater sector. The Ministry were not involved in the development of the Model Trade Waste Bylaw. However over the past 2 years we have been contributing to the Trade Waste Officers technical group of NZWWA, and will be involved in the proposed revision of the New Zealand Standard Model scheduled for late 2002.

At this point in time there is no driver for more direct intervention by the Ministry.

Appendix A: Summary of Past Government Waste Policy

1990	Labour Government announced the first national waste management policy with a target of reducing the nations solid waste to 20% below 1988 levels by 1993. This stimulated many local government and industry recycling programmes.
1992	National Government dropped the waste reduction target and focused on principles of 'waster pays' and encouraging use of the international hierarchy of waste management. The Ministry for the Environment issued the *Waste Analysis Protocol* and the *Landfill Guidelines.*
1994	The National Government set up the Sustainable Management Fund to provide financial support for initiatives that help achieve sustainable management of NZ's resources. Specific funding categories included contaminated sites and waste management. The Ministry for the Environment issued the *Hazardous Waste Management Handbook.*
1995	The Ministry for the Environment's "*Vision 2010 Environment Strategy*" reiterated the 1992 policy and identified the following key actions • implementing 'generator pays' policy • provide clear incentives to resource users that encourage waste reduction, reuse, recycling, and recovery • design and establish systems that hold resource users accountable for effective waste management • promote minimisation of domestic and municipal waste through green labelling • establish waste reduction targets for major industry • achieve high standards of waste disposal • promote assessment of contaminated sites and reduce barriers to clean-up • identify hazardous wastes and strategies to manage them The Ministry for the Environment issued the *New Zealand Landfill Census.*
1996	The National/ NZ First coalition government developed policies including • developing national standards and guidelines for landfills, solid waste disposal and hazardous waste disposal, including a timetable for phasing out hazardous, toxic and bioaccumulative substances • working with waste producers to reduce waste at source (seeking to reduce solid waste production to half the 1990 level by the year 2000)

	and to encourage reuse and recycling The Ministry for the Environment issued the *Landfill Full Costing Guideline.*
1997	The Ministry for the Environment issued the *Cleaner Production Guidelines* (a framework for business to use energy and resources more efficiently) and the *National Waste Data Report*.
1999	The Labour Party's pre-election manifesto in 1999 • reiterated the principles of the waste hierarchy and generator pays policy • included a target 40% reduction in the solid waste stream by 2010 • promised to establish a New Zealand Waste Reduction Working Party, funded by a modest levy to be collected by the owners of all landfills, and serviced by the Ministry for the Environment The manifesto specifically stated, "*New Zealand's approach so far has under-emphasized the role of waste reduction or minimisation schemes*".

Source: *Waste Minimisation in New Zealand, The Results of a Preliminary Assessment of Practice and Policy*, Local Government New Zealand, May 2000 and pers comm. MFE staff

Appendix B: Waste Policy in 2002 Election Manifestos

	Labour	National	United Future	Green	Alliance NZ
Suasive Intervention					
Support research		✓			
Assist councils, communities & business in waste minimisation & management	✓			✓	
Review government purchasing policy	✓				
Target of a waste free NZ by 2020 (or other date)				✓	✓
Identify, isolate and remediate contaminated sites				✓	
Market Based Intervention					
Require full cost pricing of disposal sites		✓			
Apply a landfill levy		✓		✓	
Apply deposit schemes	✓				
Apply predisposal levy	✓				
Apply extended producer responsibility initiatives	✓			✓	✓
Mandatory Intervention					
Develop National Environmental Standards (RMA)		✓			
Tighten waste management responsibilities for local govt under the LGA				✓	
Ban incineration of waste				✓	
Progress Chemical Trespass Act				✓	
Other					
Establish new waste agency similar to ECCA		✓		✓	
Review legislative and institutional needs	✓				
No specific waste policy			✓		

Appendix C: Matrix of Instruments for Intervention